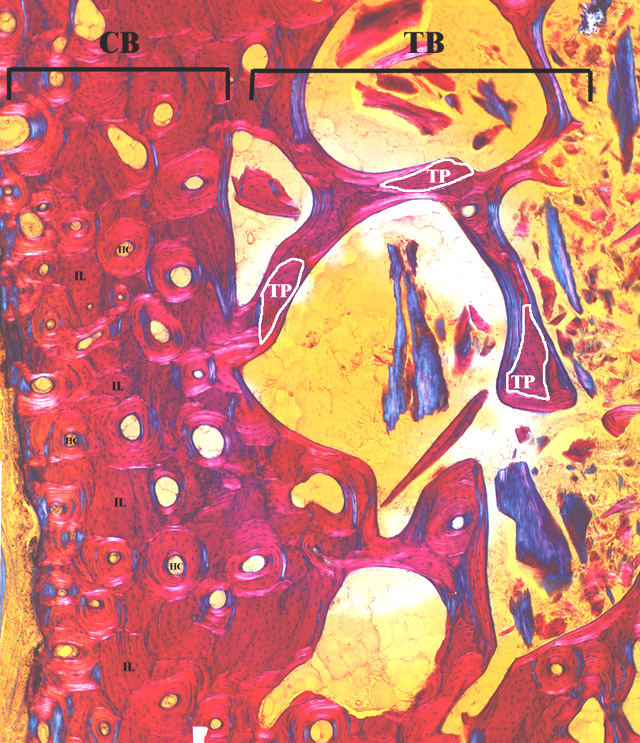
**BONE LABORATORY DEMONSTRATIONS**

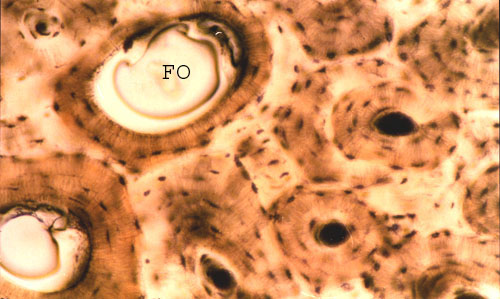
**COMPACT & TRABECULAR BONE - LM**

When viewed under the polarizing light microscope, the layering (lamella) of collagen fibers can be seen as alternating light and dark bands. In the compact bone (**CB**), the lamellae form concentric circles around the Haversian canal (**HC**). Dark-staining osteocytes are within the concentric rings. In addition, interstital lamellae (**IL**) can be clearly defined. In the trabecular bone (**TB**), the angular trabecular packets (**TP**) are clearly defined by the lamellae. 100X



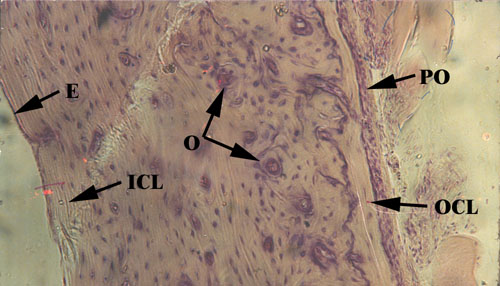
# FORMING OSTEON

This is characterized by its large Haversian canal ( **FO**; contains air bubble) and has only 2 layers of osteocytes. No osteoblasts can be observed lining this incomplete osteon because this is a ground bone section. 200X



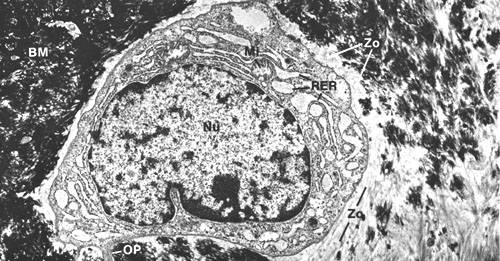
# DECALCIFIED CORTICAL BONE

Look for the following features: Periosteum (**PO**), Osteon (**O**), Outer Circumferential Lamellae (**OCL**), Inner Circumferential Lamellae (**ICL**) and Endosteum (**E**). 200X



# OSTEOCYTE - TEM

Transmission electron micrograph of osteocyte surrounded by mineralized bone matrix (**BM**). All osteocytes are surrounded by a thin zone of uncalcified matrix call osteoid (**ZO**). What does the osteoid consist of ? In what form is the mineral? 8,000X Kessel & Kardon, 1979

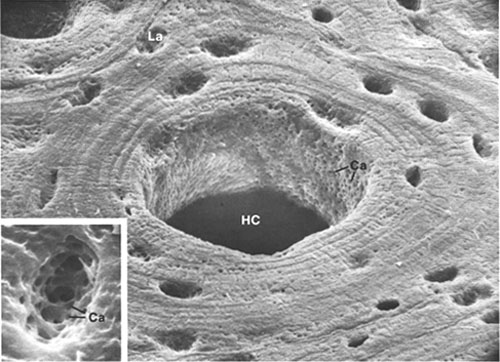


# GROUND BONE SECTION - SEM

The Lacunae (**La**) of the osteocytes are arranged around the Haversian canal (**HC**) of this Haversian system. The small openings (**Ca**) are the beginning of the small tunnels or canaliculi. What is the function of this small tunnel? 1,300X

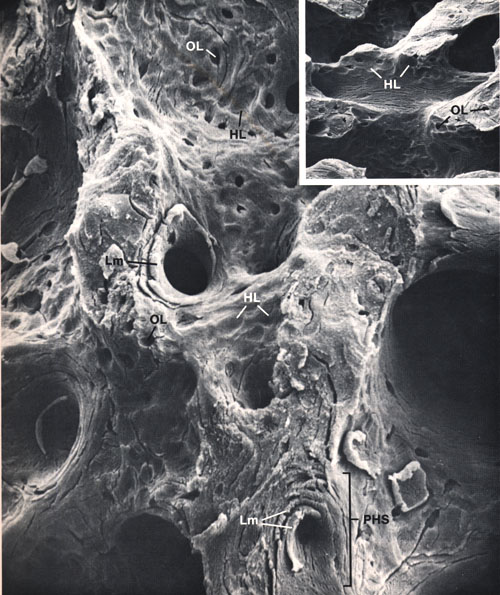
Inset: equivalent light micrograph of ground bone section. 1,000X Kessel & Karden, 1979

The lower micrograph demonstrates much of the same with the inset comparing the structure to a light micrograph of ground bone.



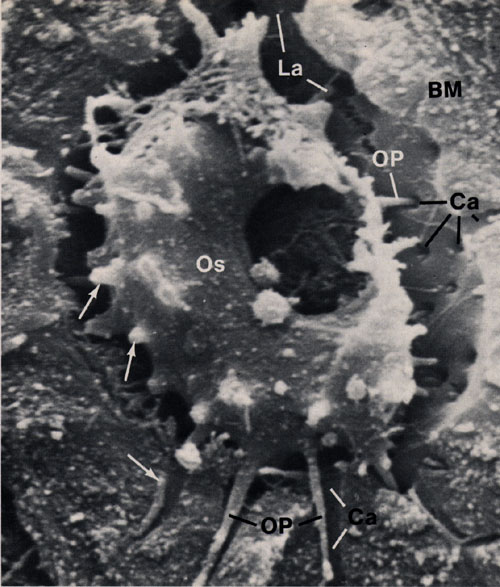
# TRABECULAR BONE SURFACE - SEM

Inset: The lacunae of osteocytes (**OL**) and Howship's lacunae (**HL**) are observed on the bone surface of this trabeculae. 265X. Large micrograph: Two layers of concentric lamellae (**LM**) can be seen around the inner aspect of a Haversian system. What cell lies in the Howship's lacunae? Why is this lacunae larger that that of the osteocytes? 600X Kessel & Karden, 1979



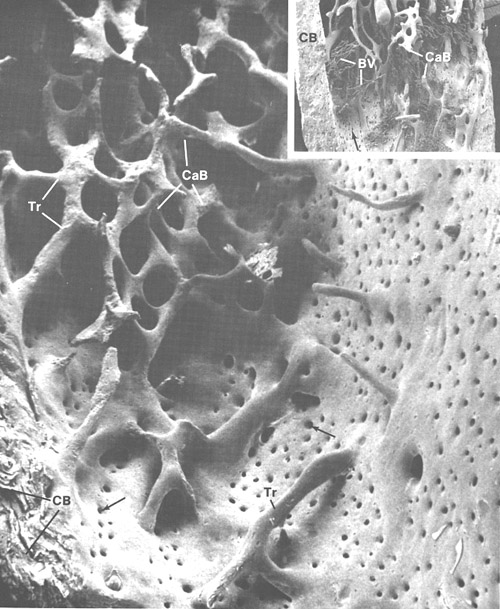
# OSTEOCYTE - SEM

Osteocyte (**OS**) in the lacunae (**La**) of the bone matrix in compact bone (**BM**). Processes of osteocytes (**OP**) enter the canaliculi (**Ca**) to communicate with other cells. 900X. Kessel & Karden, 1979



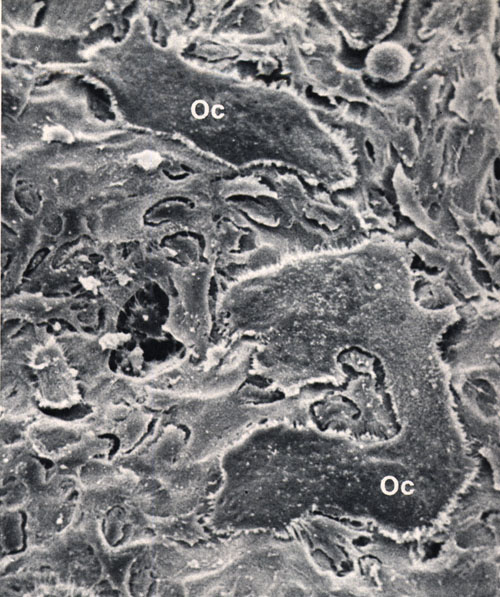
# CANCELLOUS BONE -SEM

In this micrograph the bone marrow has been removed to expose the cancellous or spongy (**CaB**) that is composed of numerous trabeculae (**Tr**). The small holes (**arrows**) are where small blood vessels enter to supply nutrients to the compact bone via Volkmann's canals. SEM 100X Kessel & Karden, 1979



# OSTEOCLASTS - SEM

Osteoclasts (**Oc**) of different shapes are observed eating into the bone matrix. Numerous microprocesses make up the ruffled border of the cell where bone removal occurs. SEM 500X Kessel & Karden, 1979





**PARTIALLY MINERALIZED BONE MATRIX - TEM**

The bone osteoid contains collagen fibers (**CF**) and areas of mineralization (**\***), which appear as black foci along the surface of the collagen fibers and spread out. TEM 7,000X Kessel & Karden, 1979

